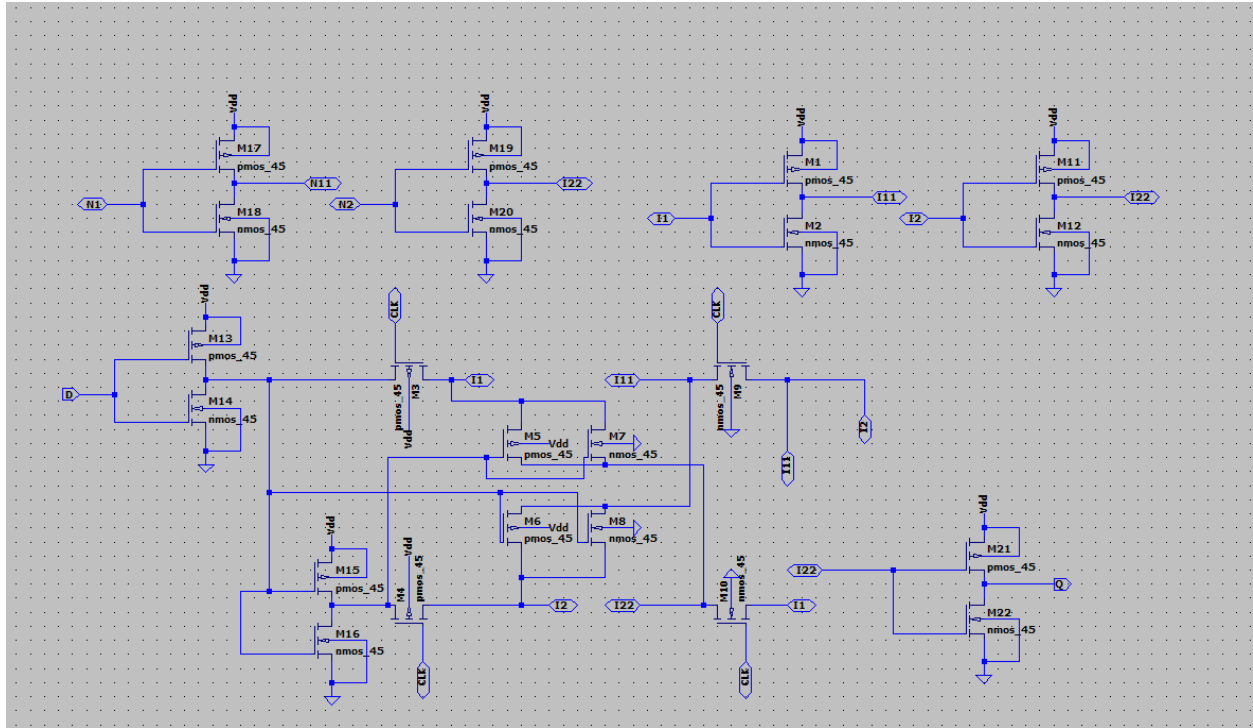ACFF


```
12        LTC = SimCommander("ACFF.asc")
13        LTC.set_parameters(w1=W[i][0], w2=W[i][1], w3=W[i][2], w4=W[i][3])#, w5=W[i][4], w6=W[i][5], w7=W[i][6], w8=W[i][7], w9=W[i][8], w1
14        LTC.run()
15        LTC.wait_completion()
16        f = open("ACFF_1.log", "r")
17        data = f.read()
18        x = data.split("\n")
19        for j in range(len(x)):
20            if x[j][0:6] == "delay:":
21                print(x[j])
22                pdp_str = x[j].split("=")
23                pdp[i] = float(pdp_str[1])
24                break
25        return pdp
26
27
```
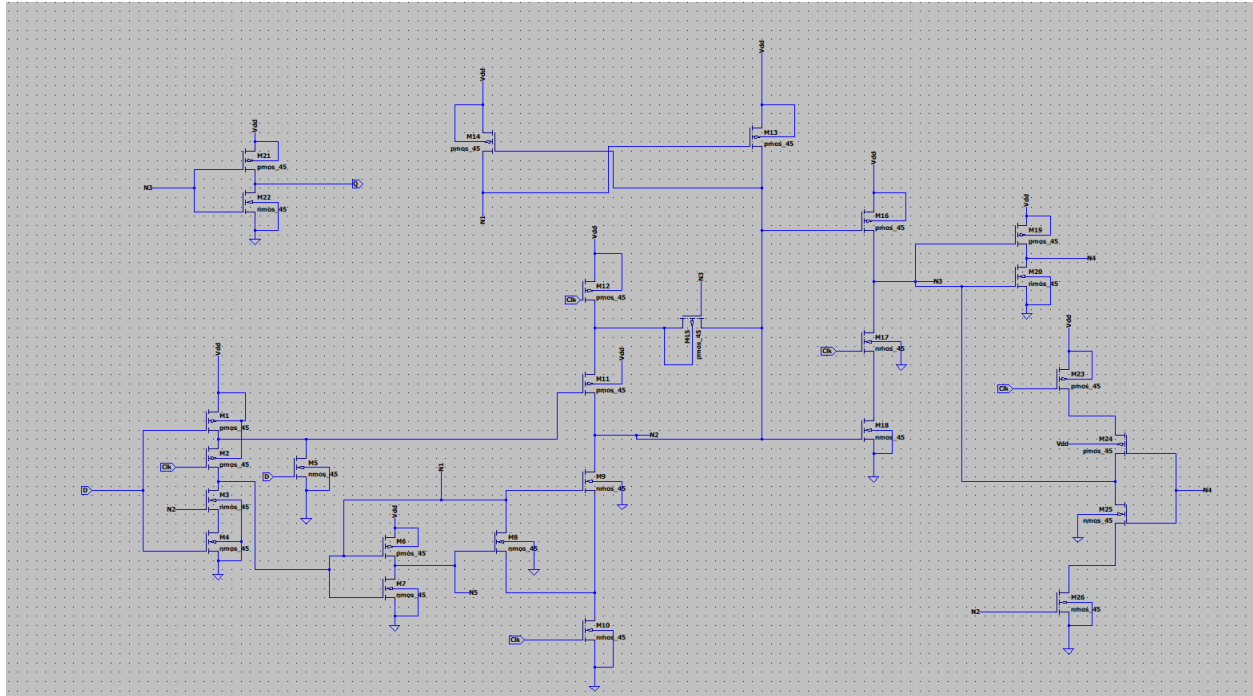
PROBLEMS   OUTPUT   DEBUG CONSOLE   **TERMINAL**

```
Wed Apr 19 19:10:24 2023 : Starting simulation 1
2023-04-19 19:10:26,363 - sim1 - INFO - Simulation Successful. Time elapsed: 00:00:00
Wed Apr 19 19:10:26 2023: Simulation Successful. Time elapsed 00:00:00:

No Callback
delay: t2-t1=2.8985e-010
pyswarms.single.global_best: 100%|                                          |15/15, best_cost=1.95e-10
2023-04-19 19:10:26,400 - pyswarms.single.global_best - INFO - Optimization finished | best cost: 1.95011e-10, best pos: [1.72589986e-07 1.27837533e-07 3.
79985917e-07 1.64602865e-07]
```

Proposed

```
12          LTC = SimCommander("proposed.asc")
13          LTC.set_parameters(w1=W[i][0], w2=W[i][1], w3=W[i][2], w4=W[i][3], w5=W[i][4], w6=W[i][5], w7=W[i][6], w8=W[i][7], w9=W[i][8], w10=
14          LTC.run()
15          LTC.wait_completion()
16          f = open("proposed_1.log", "r")
17          data = f.read()
18          x = data.split("\n")
19          for j in range(len(x)):
20              if x[j][0:6] == "delay:":
21                  print(x[j])
22                  pdp_str = x[j].split("=")
23                  pdp[i] = float(pdp_str[1])
24                  break
25      return pdp
26
27
```
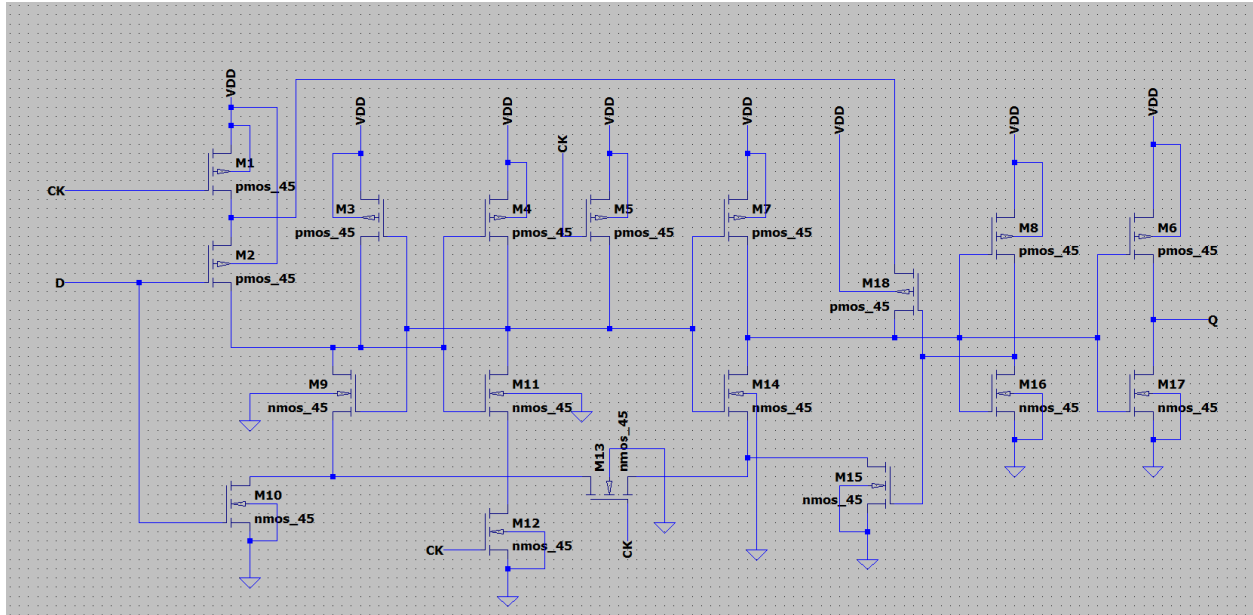
PROBLEMS   OUTPUT   DEBUG CONSOLE   **TERMINAL**   > powershell + ∨ ▢ 🗑 ⋯

```
Wed Apr 19 19:25:14 2023: Simulation Successful. Time elapsed 00:00:00:

No Callback
delay: t2-t1=5.01254e-008
pyswarms.single.global_best: 100%|                                    |15/15, best_cost=2.19e-11
2023-04-19 19:25:15,098 - pyswarms.single.global_best - INFO - Optimization finished | best cost: 2.18753e-11, best pos: [2.59074645e-07 9.59433679e-08 2.
09096585e-07 1.23764684e-07
 4.87313999e-07 7.79788916e-07 8.79828603e-07 8.79964274e-07
 8.55591165e-07 8.92113660e-07]
```

Spc-18t

```
15          LTC.wait_completion()
16          f = open("SPC-18T_1.log", "r")
17          data = f.read()
18          x = data.split("\n")
19          for j in range(len(x)):
20              if x[j][0:6] == "delay:":
21                  print(x[j])
22                  pdp_str = x[j].split("=")
23                  pdp[i] = float(pdp_str[1])
24                  break
25      return pdp
26
27
28  min_bound = np.ones(n)*90e-9
29  max_bound = np.ones(n)*900e-9
30  bounds = (min_bound, max_bound)
31  options = {'c1': 0.5, 'c2': 0.3, 'w':0.9}
```
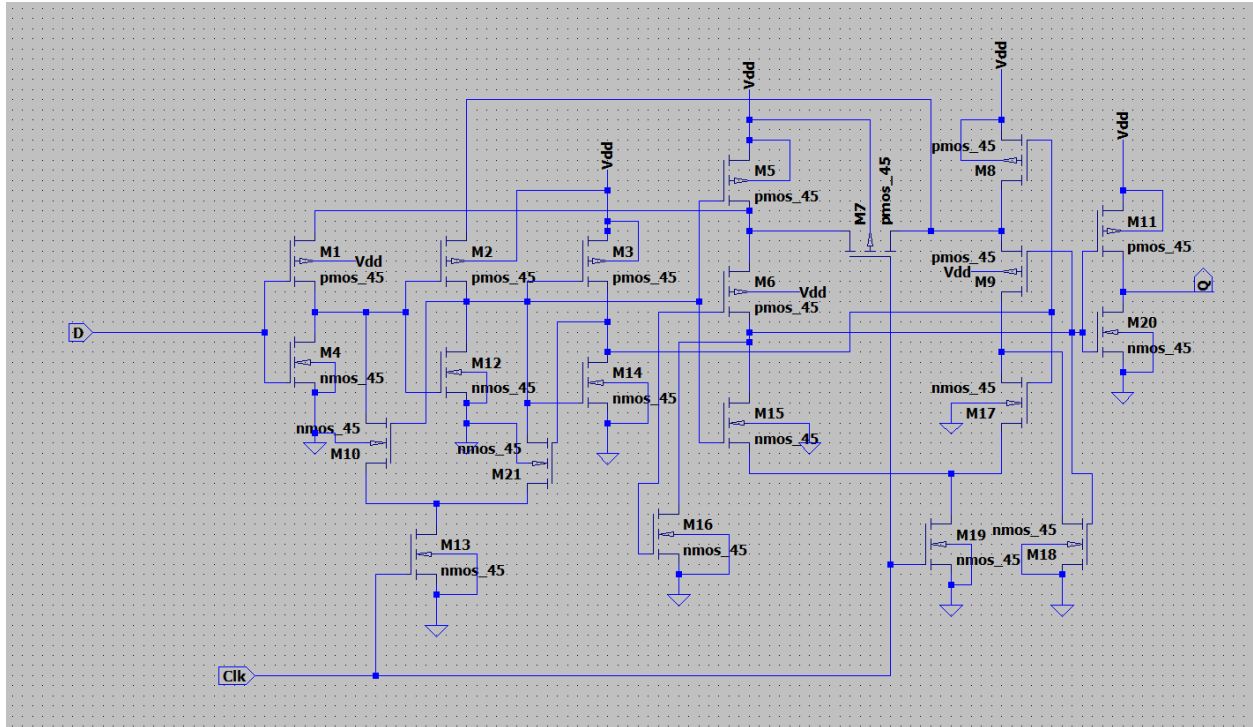
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   powershell

Wed Apr 19 19:37:49 2023: Simulation Successful. Time elapsed 00:00:00:

No Callback
delay: t2-t1=6.78943e-011
pyswarms.single.global_best: 100%| |15/15, best_cost=4.65e-11
2023-04-19 19:37:49,806 - pyswarms.single.global_best - INFO - Optimization finished | best cost: 4.65143e-11, best pos: [7.60614974e-07 5.17035478e-07 4.
29677752e-07 7.34851441e-07
 6.70678631e-07 4.01188724e-07 7.38188826e-07 7.69805332e-07
 1.56326045e-07]

TCFF

```
16          f = open("TCFF_1.log", "r")
17          data = f.read()
18          x = data.split("\n")
19  ∨       for j in range(len(x)):
20  ∨           if x[j][0:6] == "delay:":
21                  print(x[j])
22                  pdp_str = x[j].split("=")
23                  pdp[i] = float(pdp_str[1])
24                  break
25          return pdp
26
27
28      min_bound = np.ones(n)*90e-9
29      max_bound = np.ones(n)*900e-9
30      bounds = (min_bound, max_bound)
31      options = {'c1': 0.5, 'c2': 0.3, 'w':0.9}
32      optimizer = ps.single.GlobalBestPSO(n_particles=10, dimensions=n, options=options, bounds=bounds)
33      cost, pos = optimizer.optimize(LTSpice_PSO, iters=15)
```
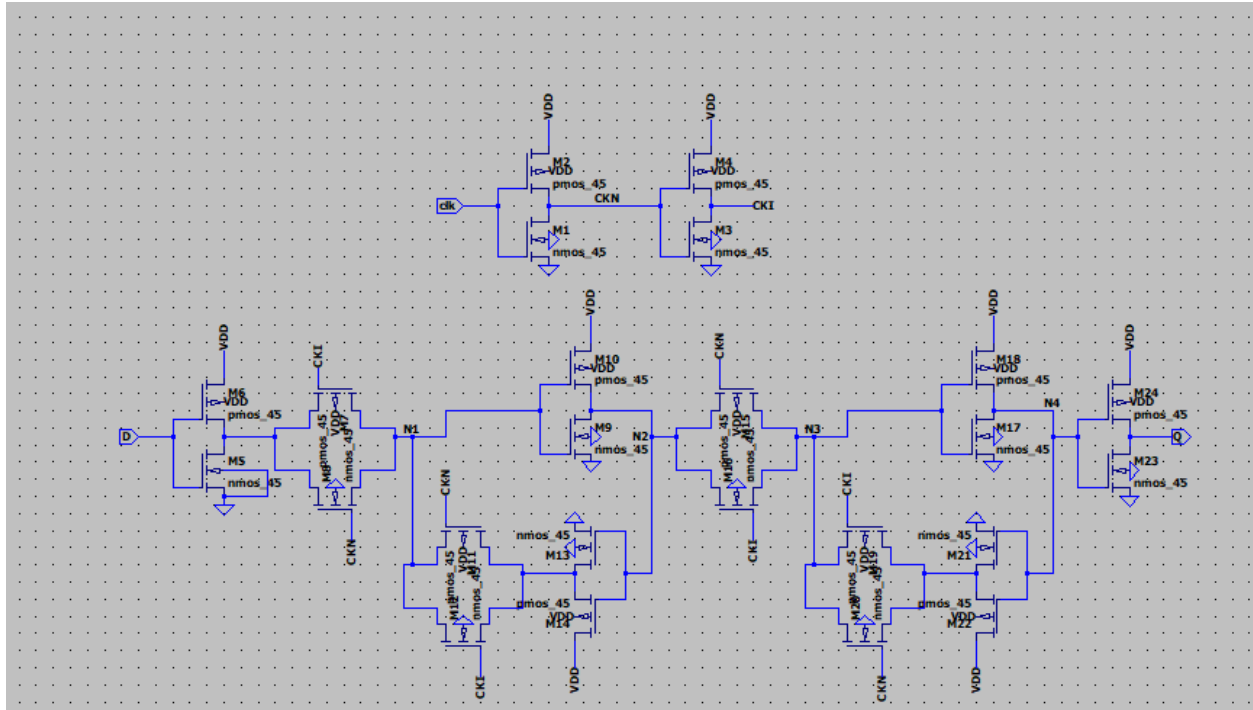
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   > powershell + ∨ ⊟ 🗑 ⋯

```
Wed Apr 19 18:58:10 2023: Simulation Successful. Time elapsed 00:00:00:

No Callback
delay: t2-t1=5.03732e-009
pyswarms.single.global_best: 100%|                                                    |15/15, best_cost=2.47e-9
2023-04-19 18:58:10,964 - pyswarms.single.global_best - INFO - Optimization finished | best cost: 2.47456e-09, best pos: [1.44976566e-07 9.84708441e-08 3.
37603187e-07 5.33013722e-07
 9.10783126e-08 6.53944782e-07 7.69141045e-07 7.06704056e-07
 6.48584333e-07 4.92087067e-07 2.58110692e-07 2.02394602e-07]
```

TGFF

```
12      LTC = SimCommander("TGFF.asc")
13      LTC.set_parameters(w1=W[i][0], w2=W[i][1], w3=W[i][2], w4=W[i][3])#, w5=W[i][4], w6=W[i][5], w7=W[i][6], w8=W[i][7], w9=W[i][8])#,
14      LTC.run()
15      LTC.wait_completion()
16      f = open("TGFF_1.log", "r")
17      data = f.read()
18      x = data.split("\n")
19      for j in range(len(x)):
20          if x[j][0:6] == "delay:":
21              print(x[j])
22              pdp_str = x[j].split("=")
23              pdp[i] = float(pdp_str[1])
```
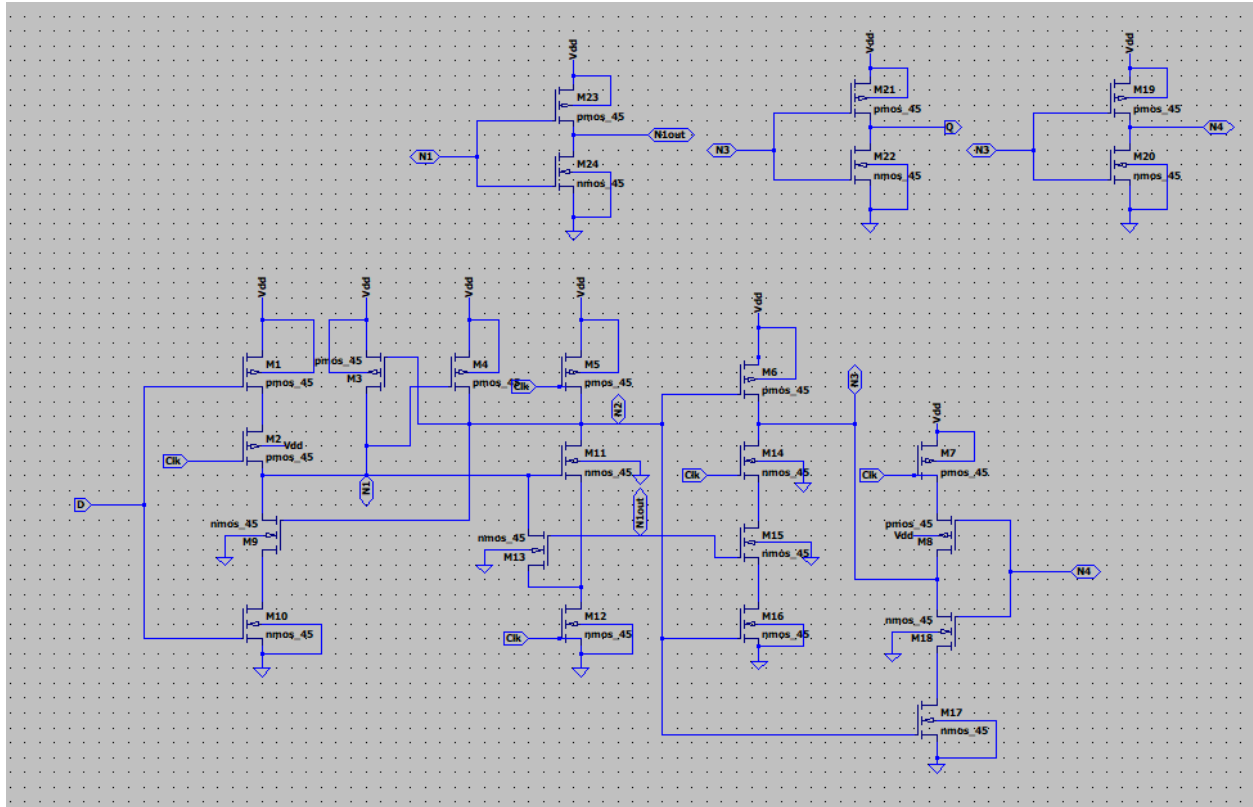
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   powershell

```
Wed Apr 19 19:48:17 2023 : Starting simulation 1
2023-04-19 19:48:18,843 - sim1 - INFO - Simulation Successful. Time elapsed: 00:00:00
Wed Apr 19 19:48:18 2023: Simulation Successful. Time elapsed 00:00:00:

No Callback
delay: t2-t1=1.82441e-010
pyswarms.single.global_best: 100%|                                    |15/15, best_cost=1.04e-10
2023-04-19 19:48:19,358 - pyswarms.single.global_best - INFO - Optimization finished | best cost: 1.03865e-10, best pos: [1.34788449e-07 7.70663897e-07 2.
56767269e-07 1.20808578e-07]
```

S2cff

```python
 9   def LTSpice_PSO(W):
10       pdp = [100.0]*10
11       for i in range(10):
12           LTC = SimCommander("s2cff.asc")
13           LTC.set_parameters(w1=W[i][0], w2=W[i][1], w3=W[i][2], w4=W[i][3], w5=W[i][4], w6=W[i][5], w7=W[i]
14           LTC.run()
15           LTC.wait_completion()
16           f = open("s2cff_1.log", "r")
17           data = f.read()
18           x = data.split("\n")
19           for j in range(len(x)):
20               if x[j][0:6] == "variable:":
21                   print(x[j])
22                   pdp_str = x[j].split("=")
23                   pdp[i] = float(pdp_str[1])
24                   break
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   **TERMINAL**   powershell + ∨ ▯ 🗑 … ∧

```
Creating Netlist
The Netlist was successfully created
Sun Apr 16 20:18:33 2023 : Starting simulation 1
2023-04-16 20:18:34,668 - sim1 - INFO - Simulation Successful. Time elapsed: 00:00:00
Sun Apr 16 20:18:34 2023: Simulation Successful. Time elapsed 00:00:00:

No Callback
pyswarms.single.global_best: 100%|                                    |15/15, best_cost=100
2023-04-16 20:18:34,683 - pyswarms.single.global_best - INFO - Optimization finished | best cost: 100.0, best pos: [1.213
50582e-07 3.94788192e-07 8.89488906e-07 4.42240482e-07
 8.45720768e-07 1.26165749e-07 8.98917095e-07 7.21013243e-07
 5.19095423e-07 3.00992282e-07]
PS C:\Users\HP\Documents\pso_project>
```